

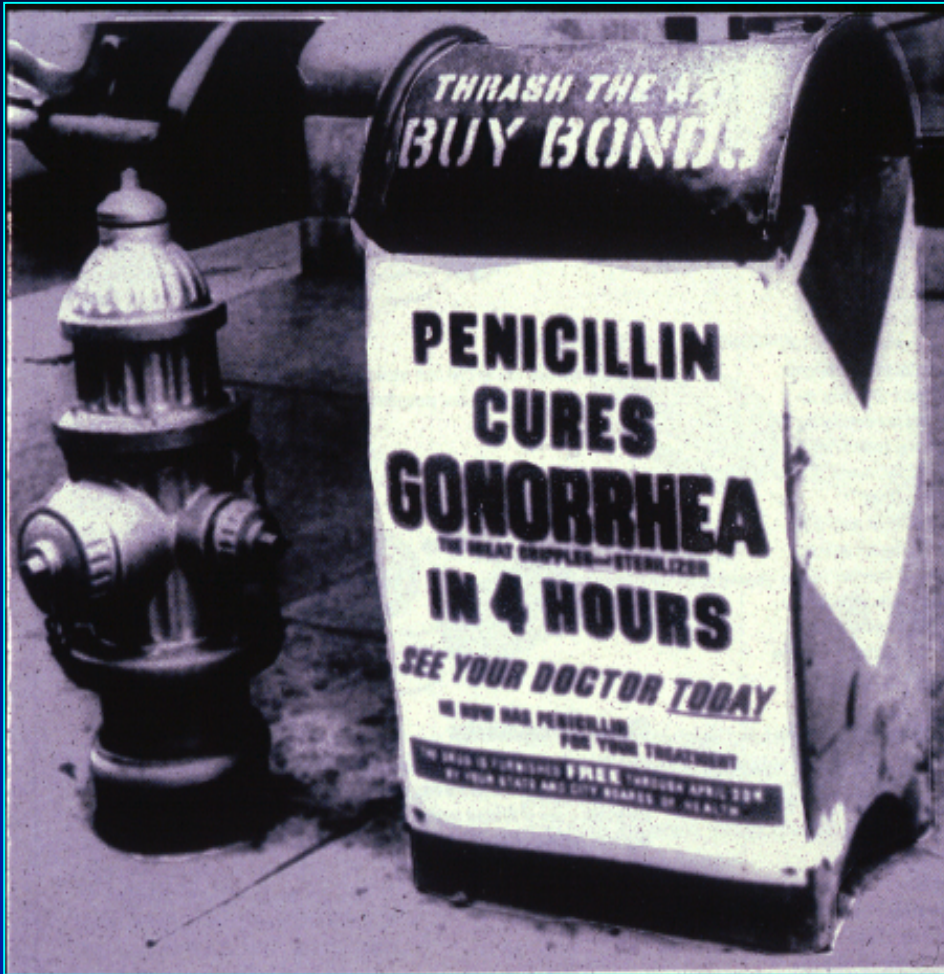
National Antimicrobial Resistance Monitoring System (NARMS)



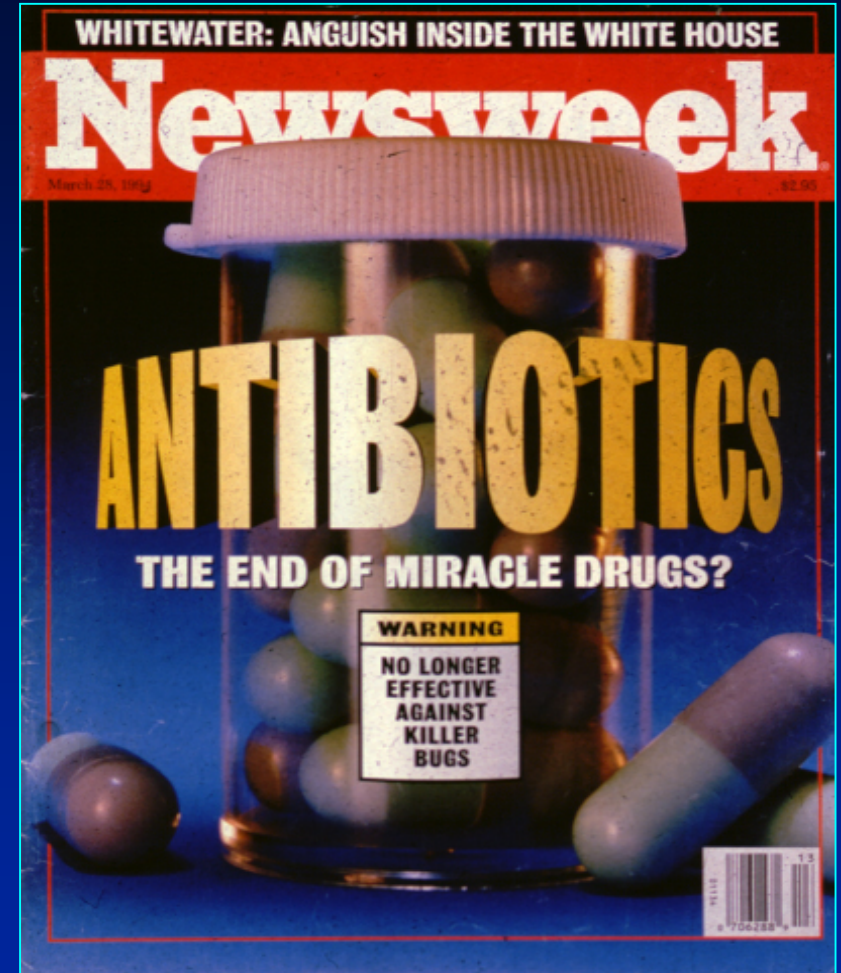
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**Center for Veterinary Medicine
External Review of the NARMS Research Programs
FDA's Science Board Meeting – November 4, 2005**

Use of Antimicrobials, Have We Come Full Circle?



50 years ago – ABs miracle drugs



Today – ABs no longer effective

National Antimicrobial Resistance Monitoring System (NARMS)

- safer food supply
- protect public health
- consumer confidence
- international trade



NARMS

National Antimicrobial Resistance Monitoring System

Food and Drug Administration • Centers for Disease Control and Prevention • United States Department of Agriculture

NARMS -
National
Antimicrobial
Resistance
Monitoring
System



NARMS - collaborative nationwide surveillance of antimicrobial resistance by CDC, FDA and USDA (managed by FDA)



Department of Health and Human Services
Centers for Disease Control and Prevention

NARMS (CDC)
- Human



U.S. Food and Drug Administration

NARMS (FDA)
- Retail meat



United States Department of Agriculture
Agricultural Research Service
the in-house research arm of the USDA

NARMS (USDA)
- Animal

NARMS – main objectives

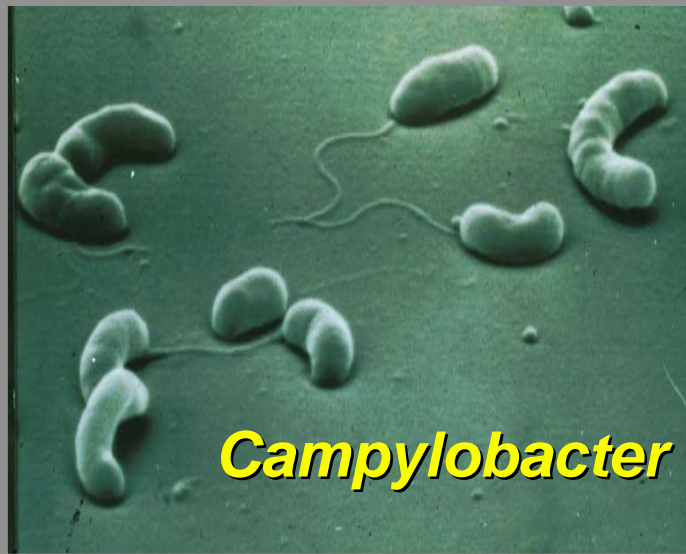
- Enable risk-based decision making
 - FDA/CVM relies on NARMS data in deciding whether to approve new antimicrobial drugs for food-producing animals
 - FDA/CVM relies on NARMS data in deciding whether to withdraw new antimicrobial drugs for food-producing animals
- Promote prudent and judicious use of antimicrobials
 - Prolong the efficacy and useful life of antimicrobials
- Identify emerging antimicrobial resistance problems
- Guide prescription practices
- Encourage standardization of laboratory techniques
- Identify areas for more detailed investigation

NARMS – key bacteria under surveillance

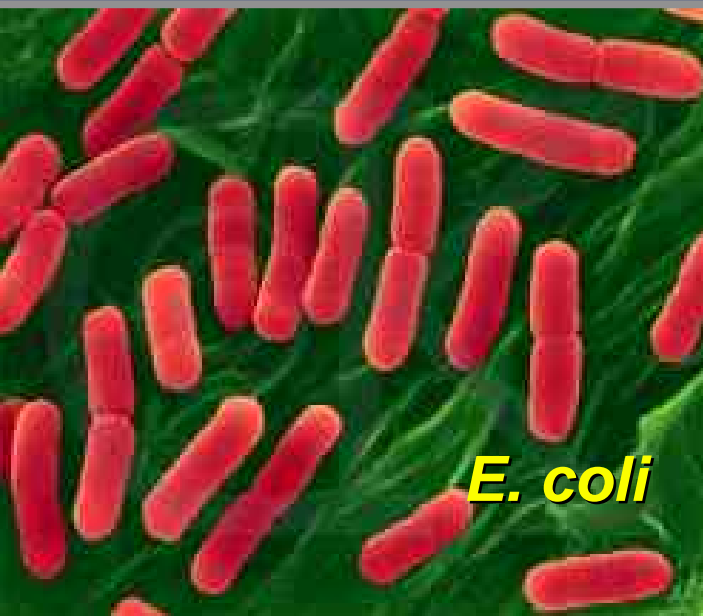
In USA, *Salmonella* and *Campylobacter* are the most common foodborne bacterial pathogens



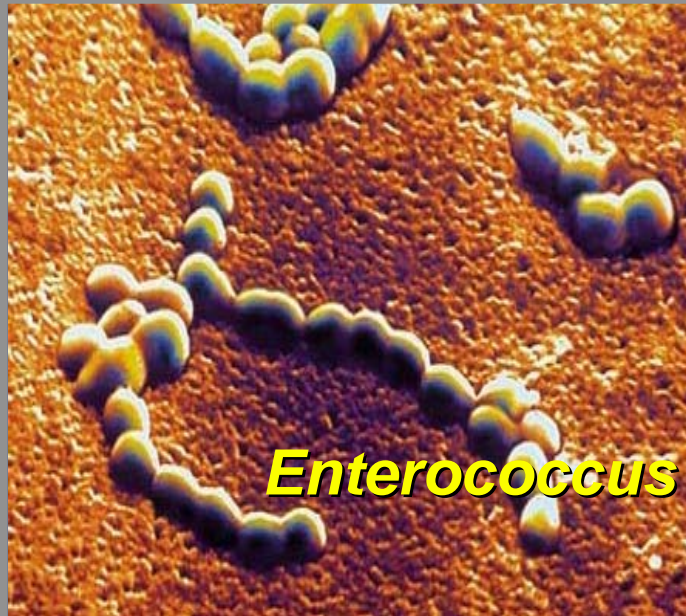
Salmonella



Campylobacter



E. coli



Enterococcus

Foodborne illness in USA each yr,

◆ **76 M illnesses**

- 30% bacteria

- 67% viruses

- 3% parasites

◆ **5,000 deaths**

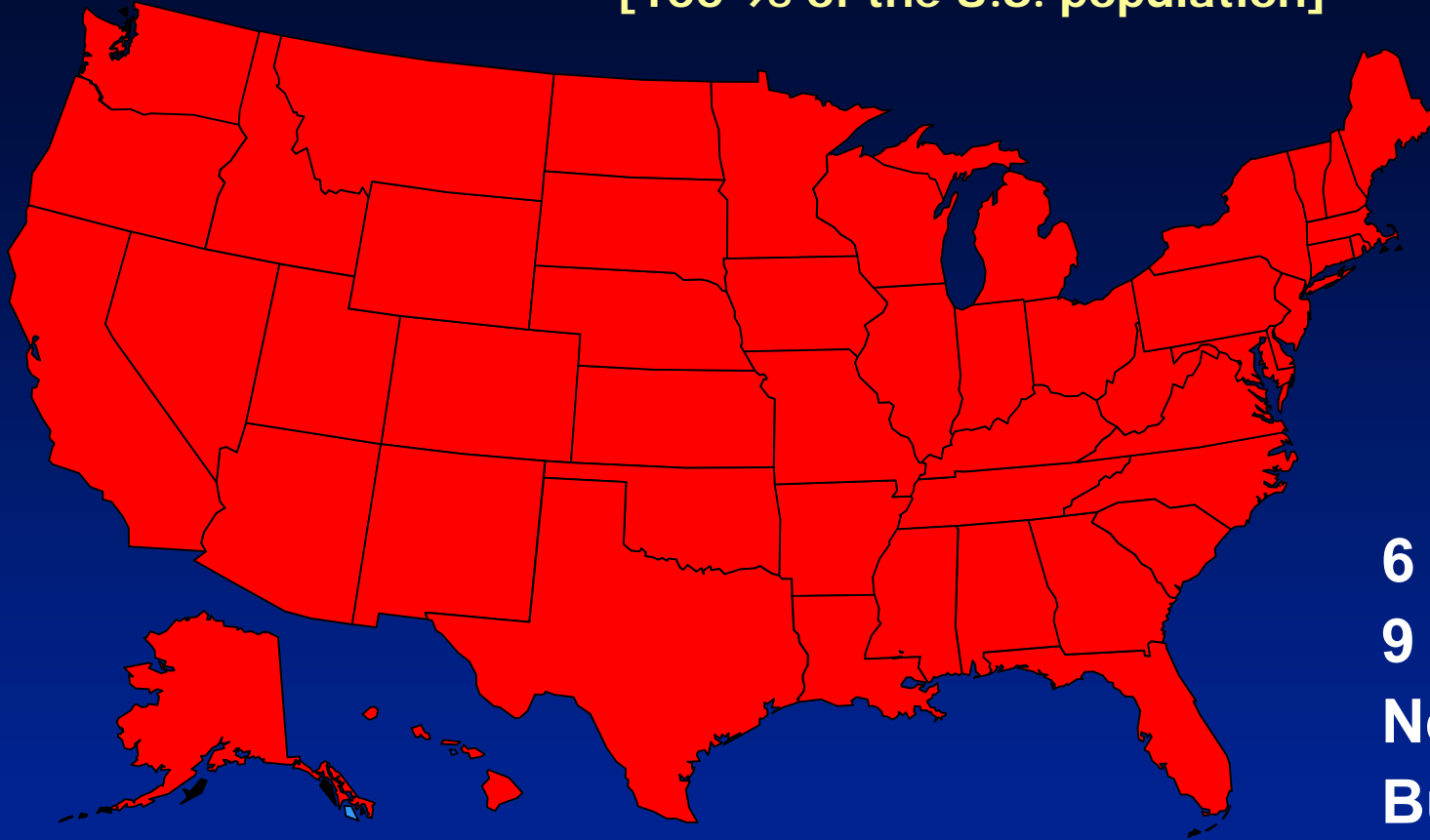
E. coli and *Enterococcus* are commensals (can carry resistance)

Why do we want an external review of NARMS?

- **Antimicrobial resistance is a growing public health concern worldwide**
- **We need national surveillance data to identify emerging problems from resistant pathogens (not a simple matter)**
- **We need a system that permits early warning of impending resistance trends so that intervention measures can be implemented**

NARMS (CDC): General Surveillance Area, 2003

[100 % of the U.S. population]



6 epidemiologists,

9 laboratorians

New office/lab space

Budget: about \$1.7 M
from FDA and CDC

Nationwide, 50 states, 9 bacteria

Campylobacter, Enterococcus, E. coli,
E. coli O157, Listeria, Salmonella (Typhi
and non-Typhi), Shigella, and Vibrio

NARMS (CDC) - Important Trends observed

**Increase in resistance to clinically important
antimicrobial agents**

- Fluoroquinolones – *Campylobacter*,
Salmonella including *S. Typhi*, *Shigella***
- Third generation cephalosporins –
*Salmonella***

Increase in multidrug resistance

- MDR-AmpC *Salmonella* Newport**

NARMS (FDA) Retail Meats Overview

10 FoodNet sites as of November 2005

CT, GA, MD, MN, TN, OR,
NY, CA, CO and NM

Sites visit at least one grocery store
per month to purchase 40 meats
– 10 packages each of:

Chicken breasts

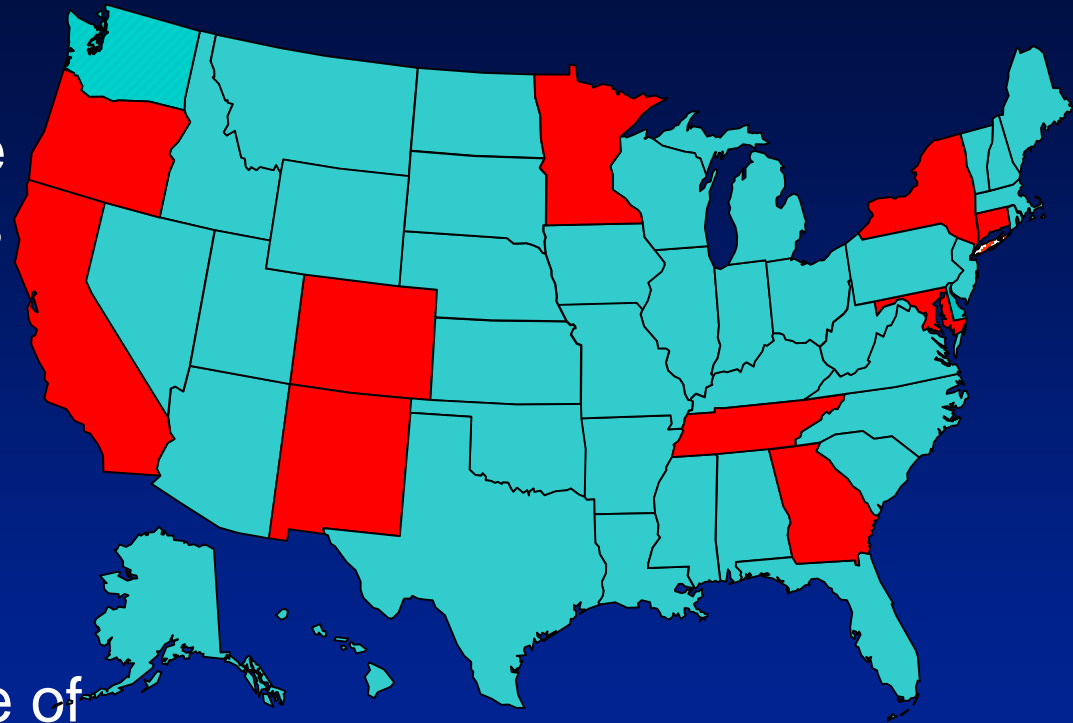
Pork chops

Ground turkey

Ground beef

All ten sites culture for the presence of
Salmonella and *Campylobacter*.

Four of the ten sites also culture for
E. coli and *Enterococcus*



■ Retail food study sites;
FoodNet labs

Introduced random (more representative) sampling Jan 2005

NARMS (FDA) retail meat program examines:

- prevalence of foodborne pathogens
- resistance to drugs (imp vet & human med)

CVM's approach - focus on the meats, bugs and drugs that are most important to public health

beef

chicken

pork

turkey



Salmonella



Campylobacter



E. coli



Enterococcus

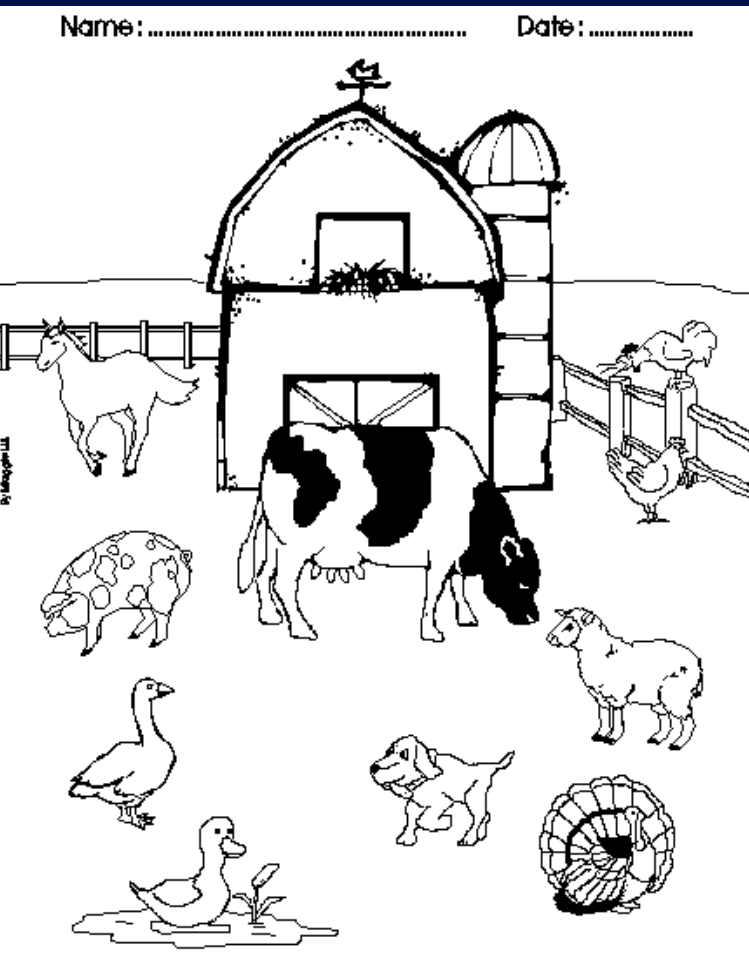
NARMS (USDA) Animal Overview

- Directed sampling of eastern USA using HACCP program samples (hazard analysis and critical control points)
- Isolates are collected from: cattle, dairy cattle, swine, chickens, turkeys, cats, dogs, exotic species, etc.
- Isolates are collected from: non-diagnostic sources, diagnostic (veterinary clinics), on-farm (small percentage)
- Samples are tested for: *Salmonella*, *Campylobacter*, *E. coli*, and *Enterococcus*



Eastern USA slaughter plants (small, medium and large) are sampled every 6 months

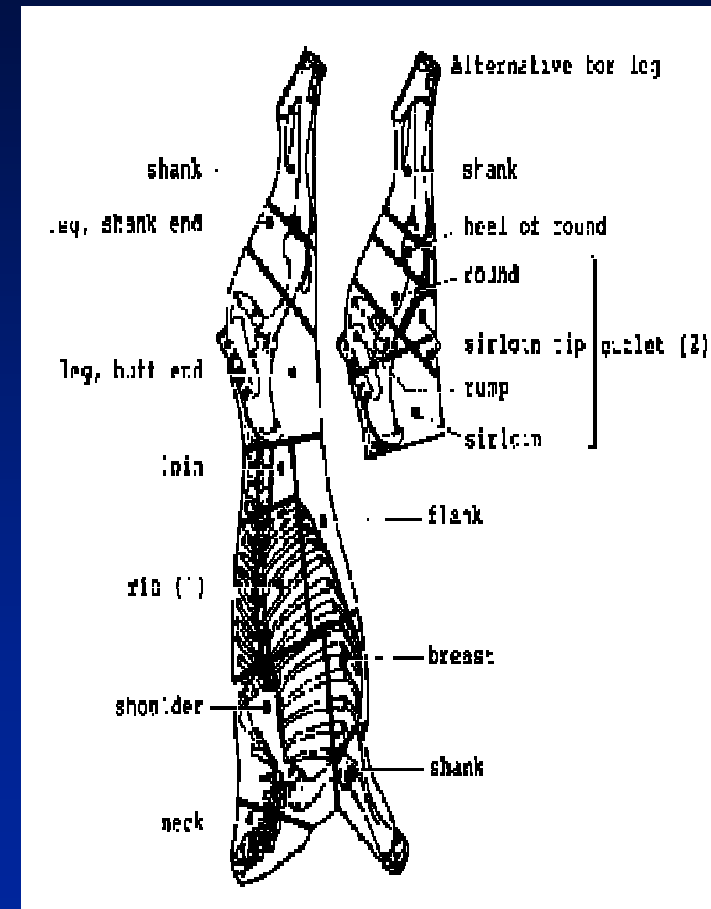
NARMS (USDA) – What is the association between farm and slaughter plant?



Farm sampling and diagnostic isolates are INDEPENDENT of slaughter program

What is the association between the farm and plant?

??



NARMS – June '05 initial review

6 specific aspects of NARMS were reviewed:

1. Animal arm sampling scheme
 - a) slaughter samples are for *Salmonella* only – is this adequate for other bacteria being tested?
 - b) rinsates for *Campylobacter* were questioned (due to lability concerns)
2. New, random sampling for retail meat arm
3. Data reporting (annual reports) for 3 arms
4. Methods of molecular characterization
5. International efforts
6. Future of NARMS funding (& suggestions for cuts considered)

NARMS – June '05 initial review

Main suggestions included:

1. Animal arm sampling scheme should be improved
 - a) animal arm sampling to be more representative (avoid multiples & sick animals, more on-farm)
 - b) *Campylobacter* lability to be tested
2. Sampling for retail meats to be more focused
3. Annual data should be reported more quickly, aim for consolidated report ASAP
4. Molecular methods to be reviewed
5. Strong support for NARMS international efforts
6. Future funding minimal - suggested less critical research activities for possible decreases

NARMS reporting – currently separate reports

More details and data available on the CVM webpage and links to CDC, FDA and USDA annual reports

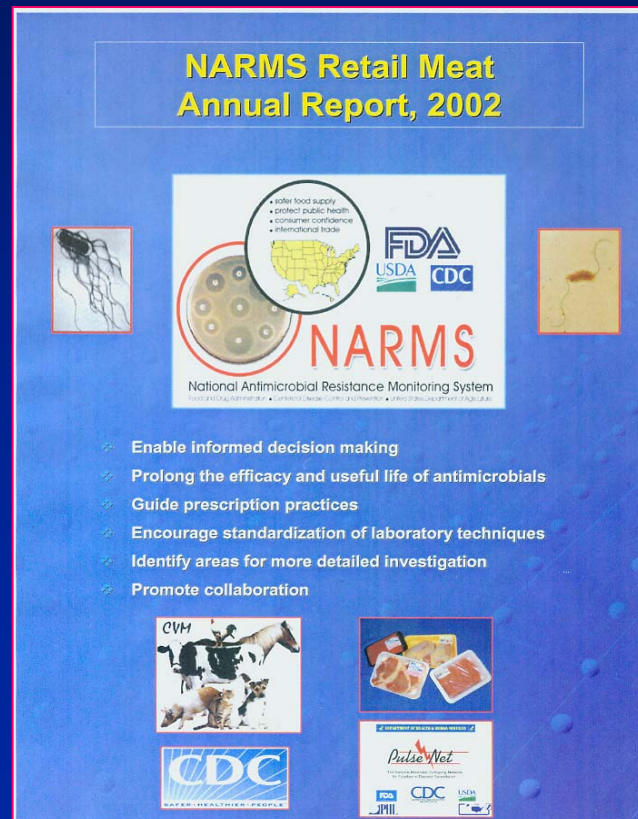
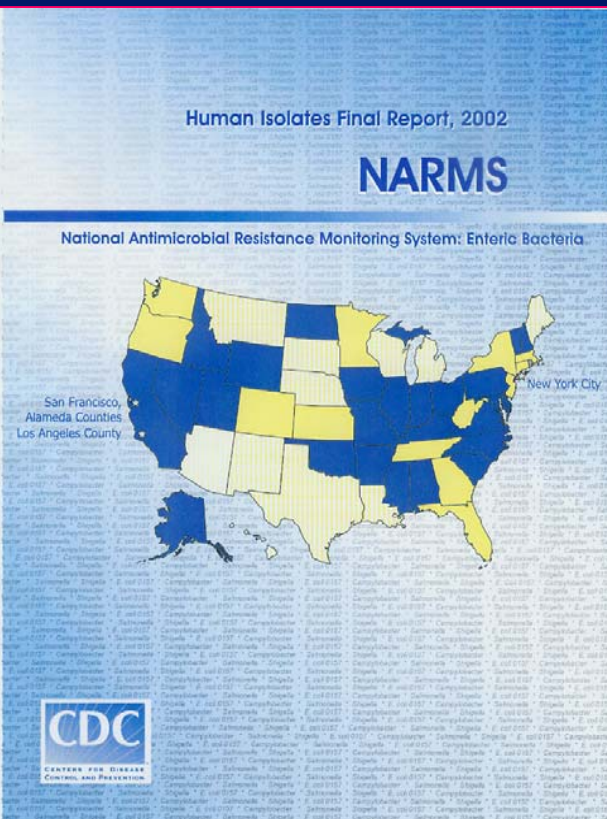
http://www.fda.gov/cvm/narms_pg.html

Already reporting more quickly and toward a consolidated report

CDC – Human origin

FDA/CVM – Retail meats

USDA – Animal origin



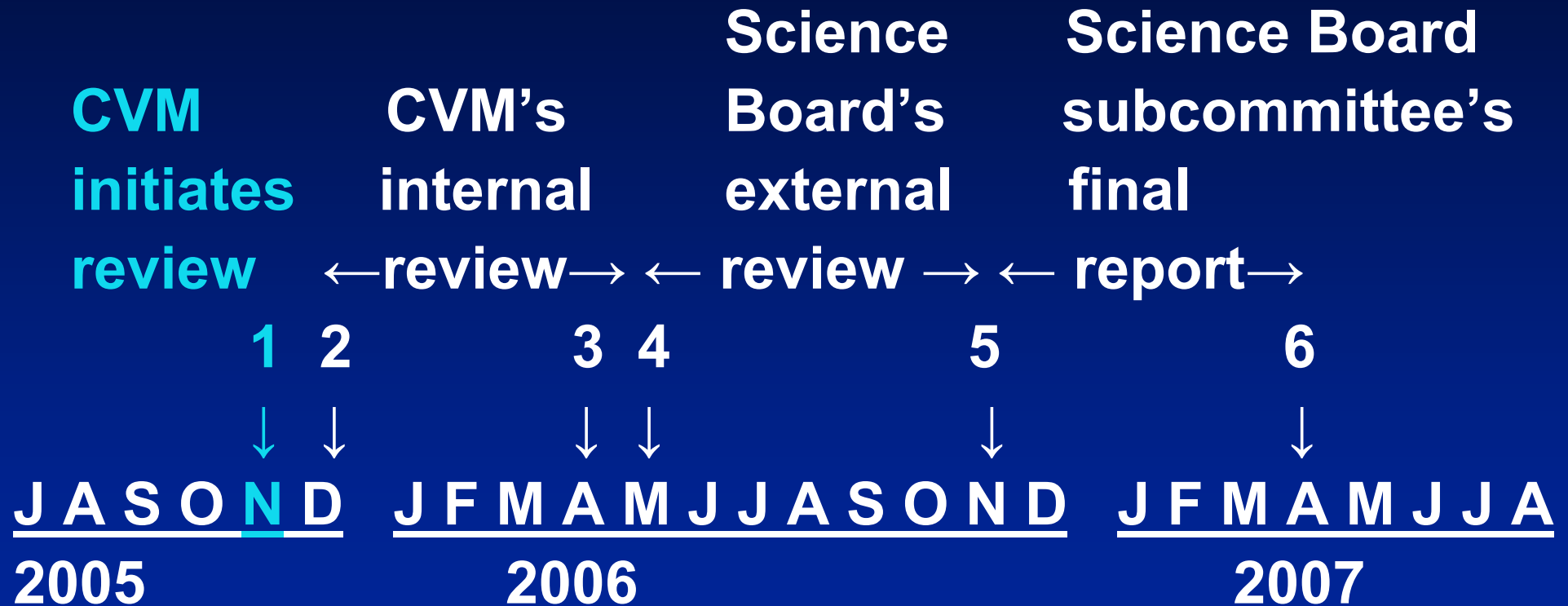
What outcomes do we want to achieve from the external review of NARMS?

- NARMS can meet the data needs of FDA/CVM for assessing new animal drugs applications
- CVM aims for excellence in NARMS surveillance programs
- NARMS annual reports seen as more useful (and reports for the three arms are consolidated)
- NARMS to be an early warning system (& position NARMS to provide such warnings)

Broad perspective desired for external review

- What are the key elements necessary for critical public health surveillance of important foodborne pathogens?
- Does NARMS contain those elements?
- Public recognition that NARMS is:
 - 1) high priority public health surveillance system
 - 2) valuable national resource

NARMS – proposed timeframe for review



(total time: 1 yr, 6 - 10 mos)